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Curry

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(54) **FIRE CONTROL MECHANISM FOR A FIREARM**

(75) Inventor: **Brett Curry**, Chicopee, MA (US)

(73) Assignee: **Smith & Wesson Corp.**, Springfield, MA (US)

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(51) **Int. Cl.**
F41A 17/36 (2006.01)

(52) **U.S. Cl.** **42/70.02**; 89/144; 89/149

(58) **Field of Classification Search** 42/70.02, 42/69.01; 89/132, 144, 149
See application file for complete search history.

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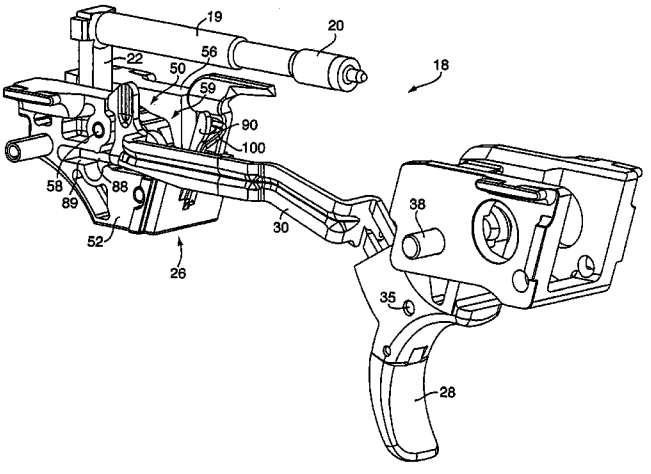
Primary Examiner—Stephen M Johnson
(74) *Attorney, Agent, or Firm*—McCormick, Paulding & Huber LLP

(57) **ABSTRACT**

A firearm includes a frame and a slide. A firing mechanism for the firearm includes a striker-type firing pin, a trigger, and a trigger bar. A sear inside the frame is pivotally balanced about a central fulcrum, and is biased in a first pivotal direction by a spring. In this position, a rear portion of the sear engages the firing pin. Actuation of the trigger causes the trigger bar to move rearwards for engagement of a forward portion of the sear. This pivots the sear in a second pivotal direction, against the spring, which releases the firing pin. The spring then causes the sear to pivot back for reengaging the firing pin when it returns to its rear position. Movement of the slide to a retired position causes the trigger bar to disengage from the sear (preventing discharge of the firearm) until the slide returns to a battery position.

20 Claims, 16 Drawing Sheets



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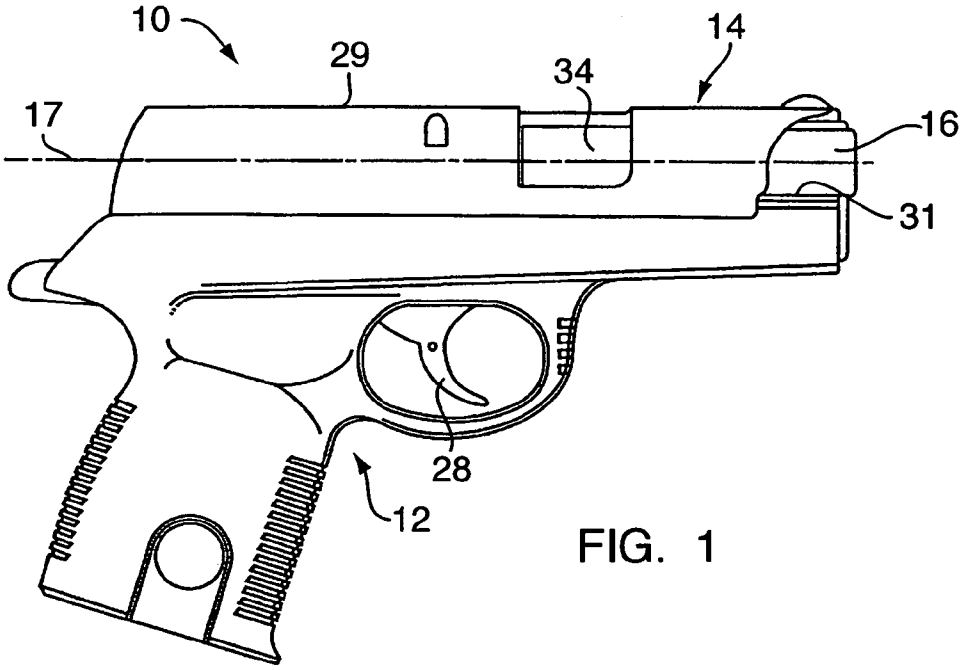


FIG. 1

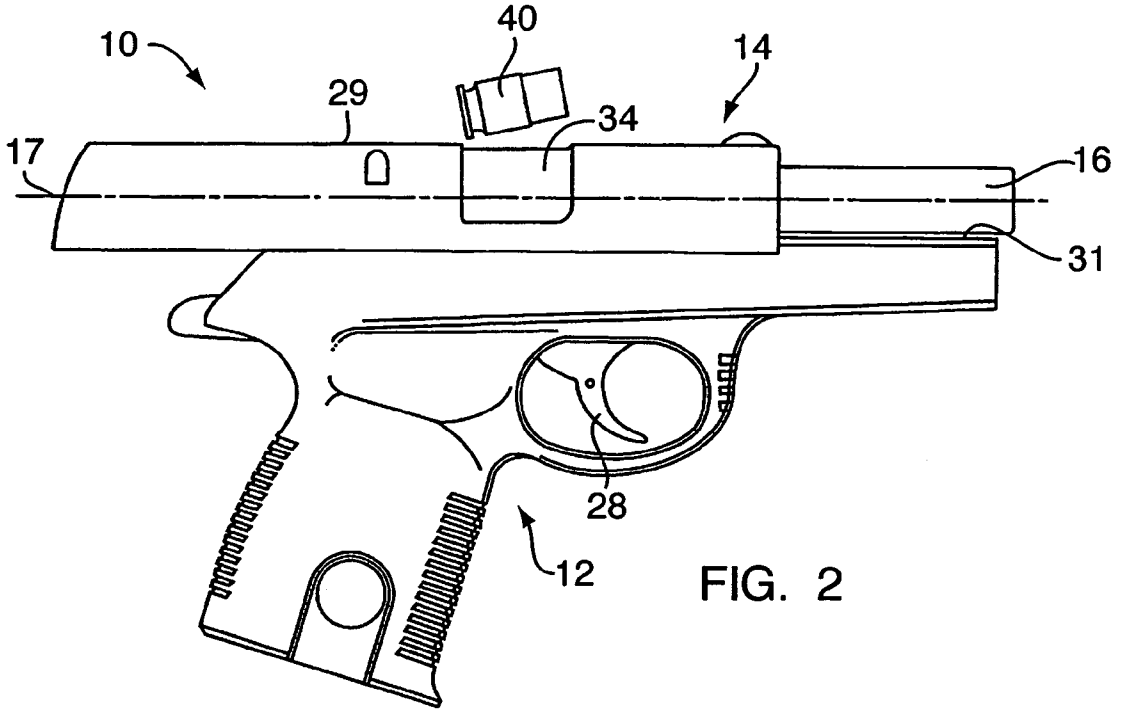


FIG. 2

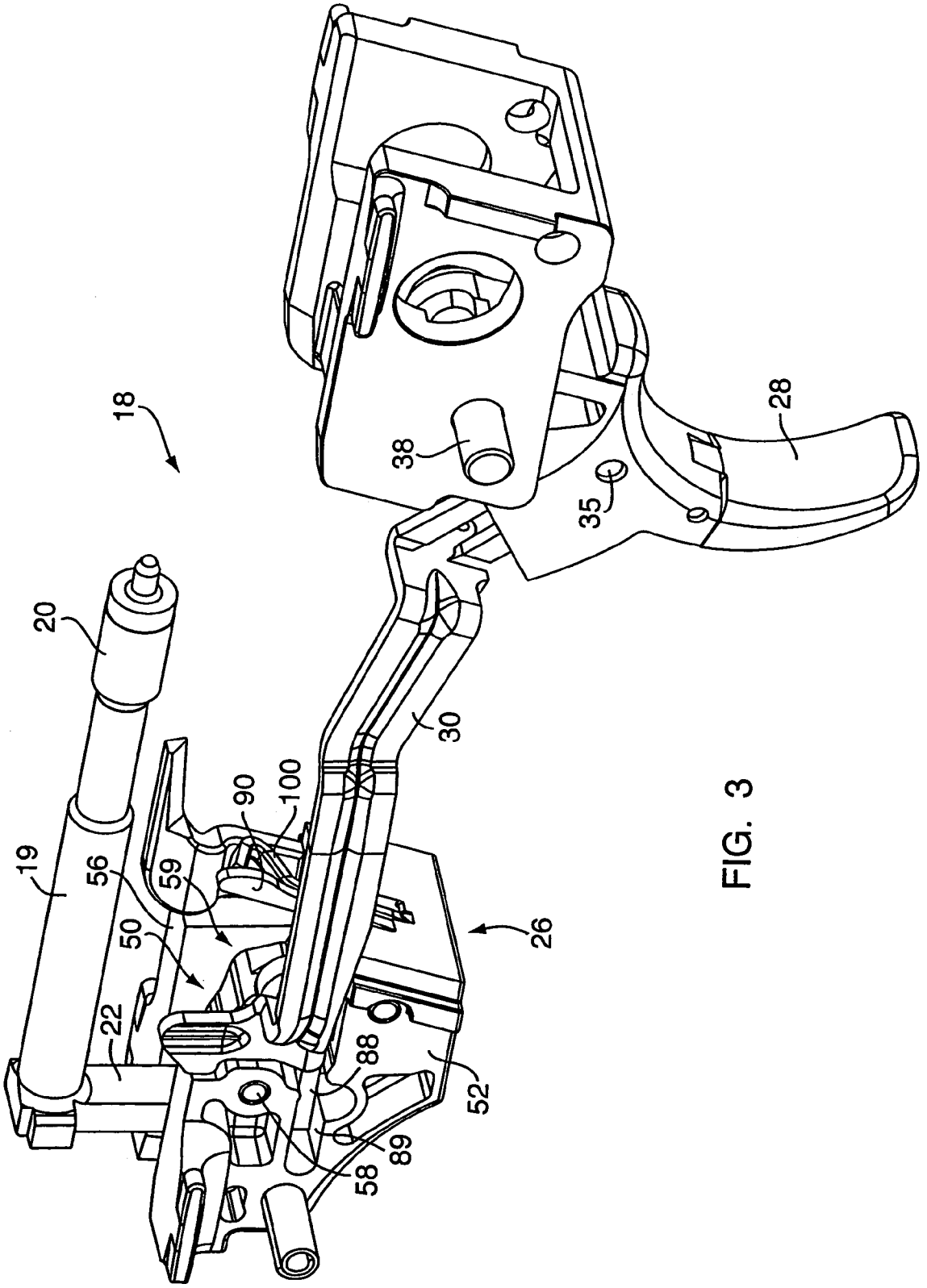


FIG. 3

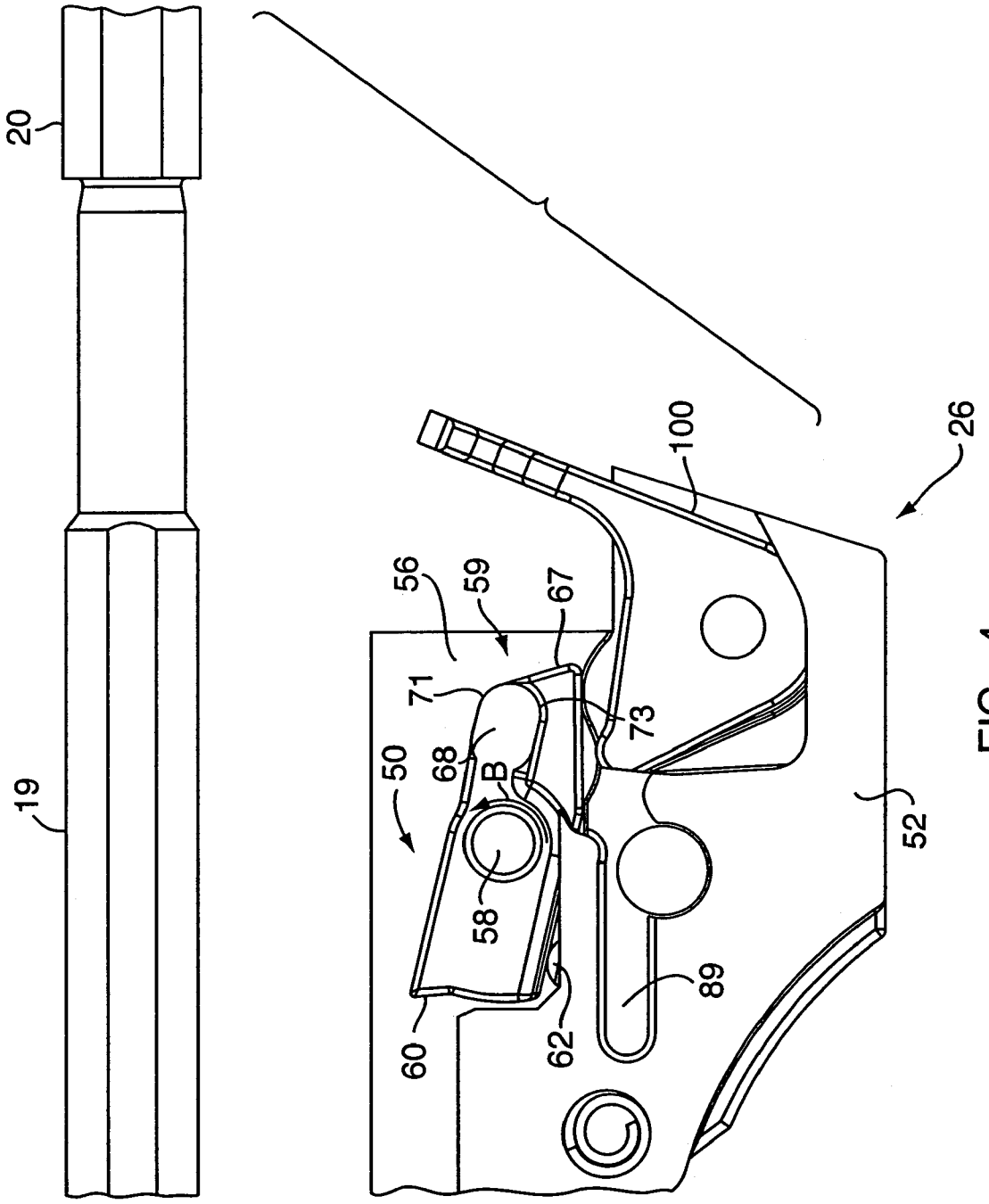


FIG. 4

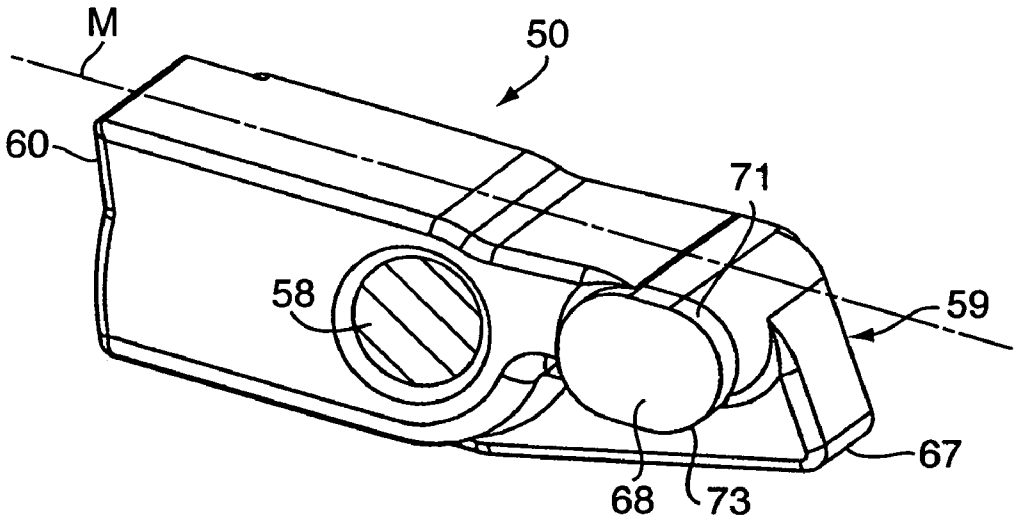


FIG. 5

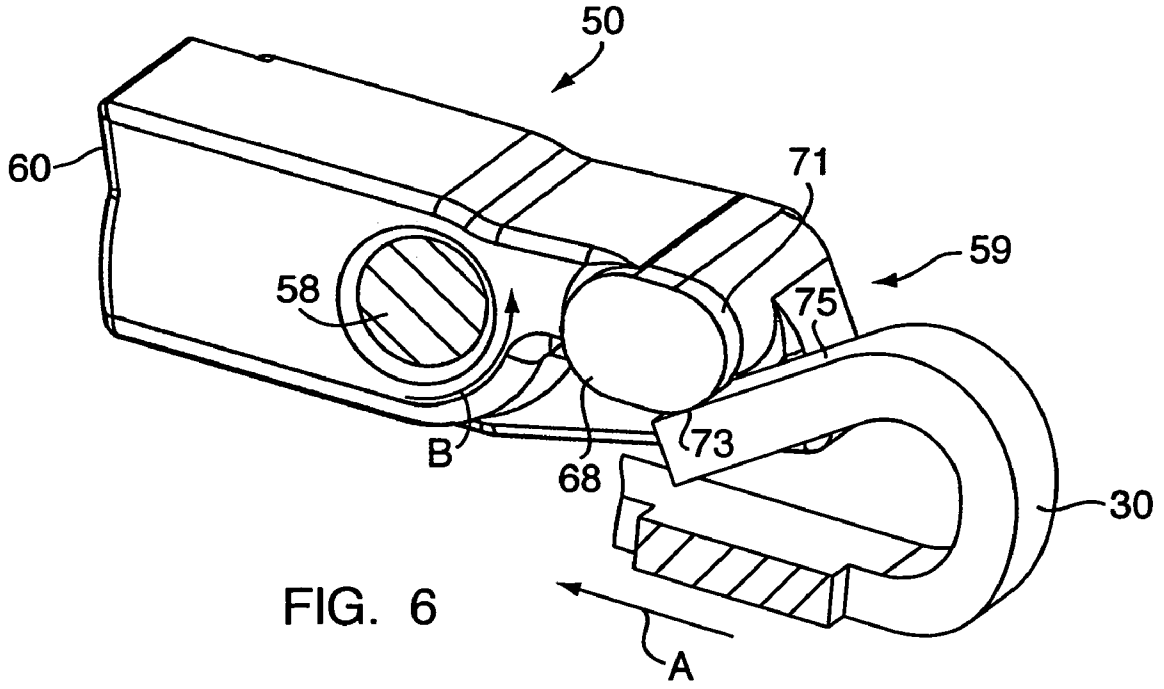


FIG. 6

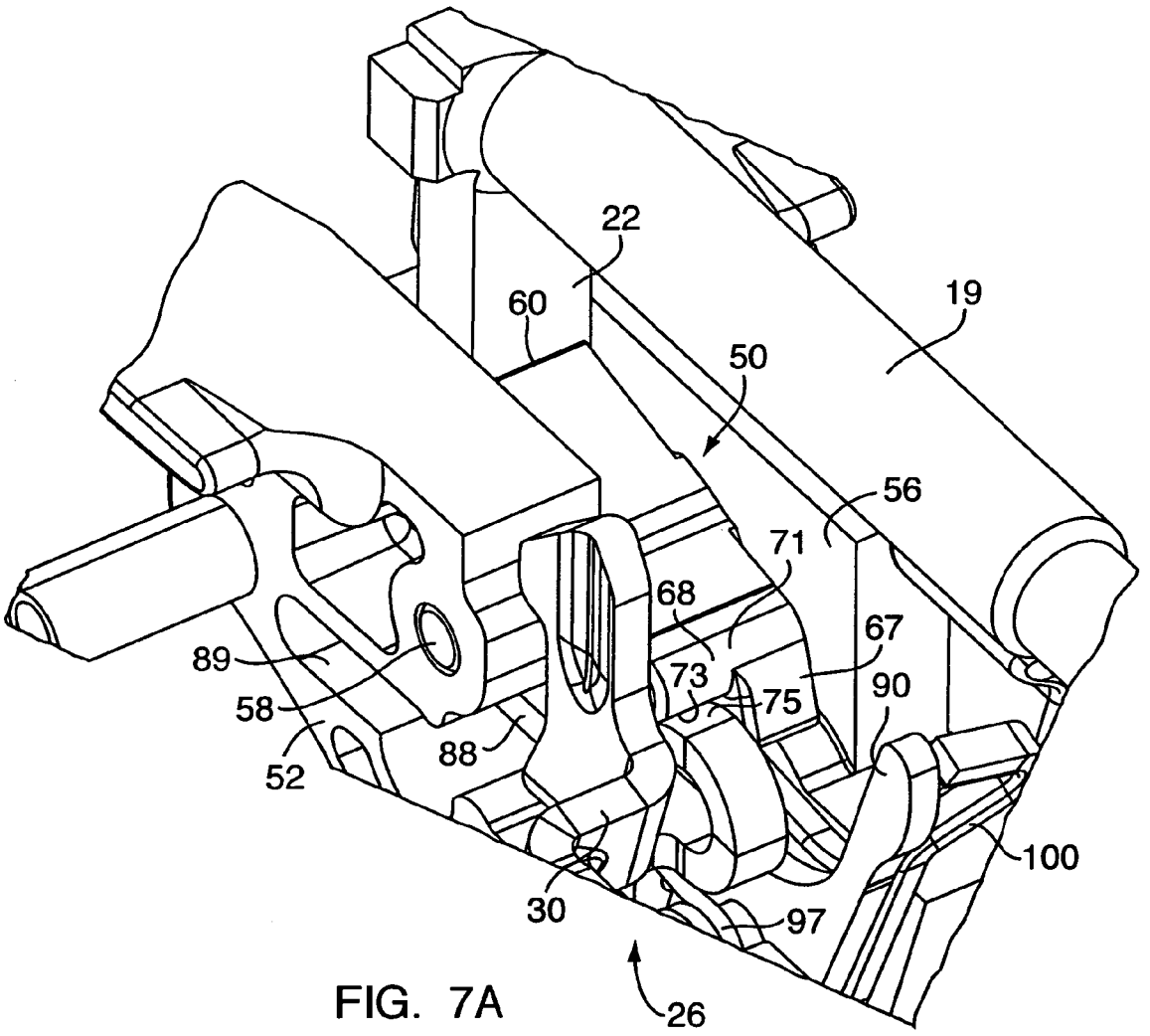


FIG. 7A

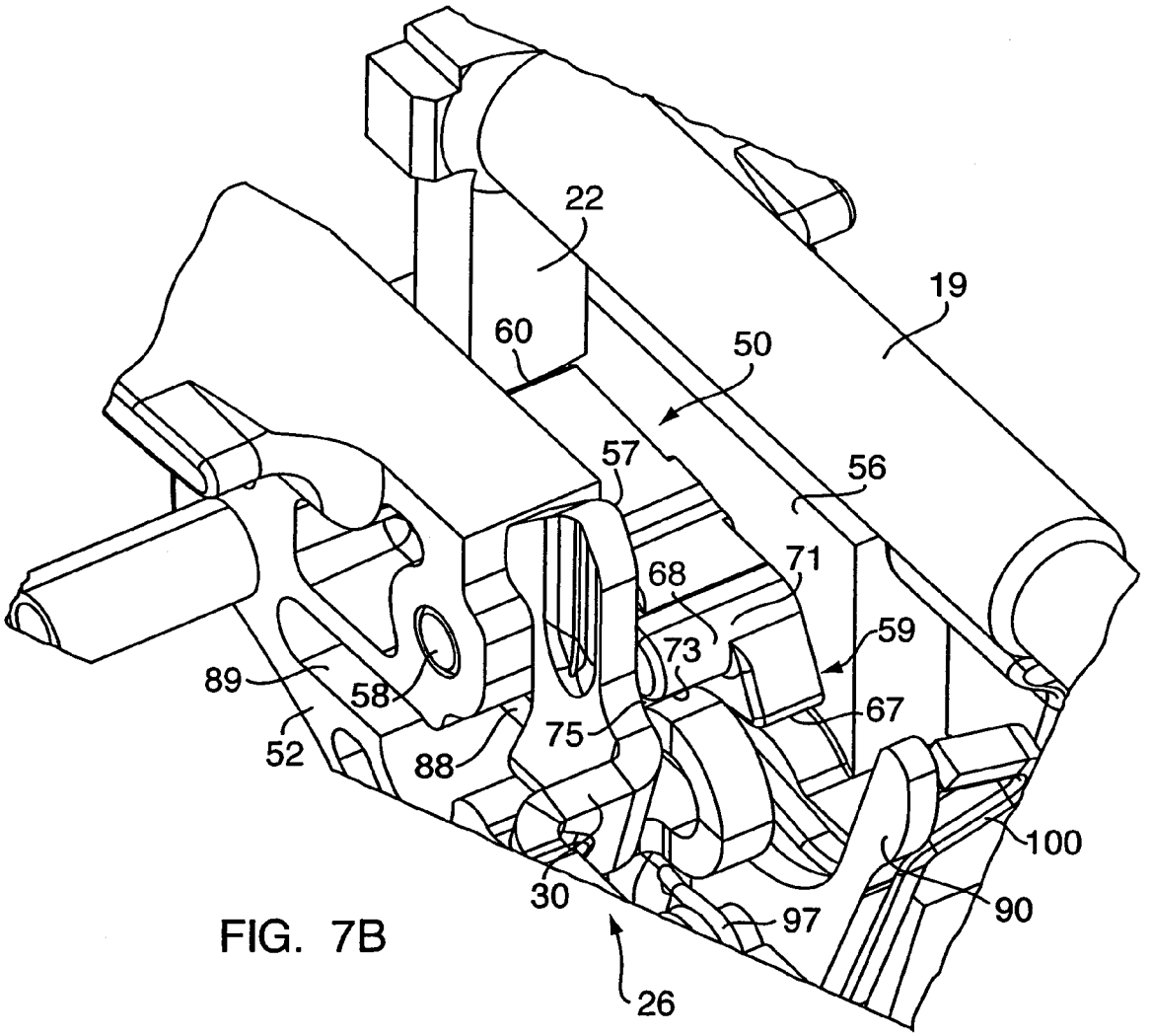


FIG. 7B

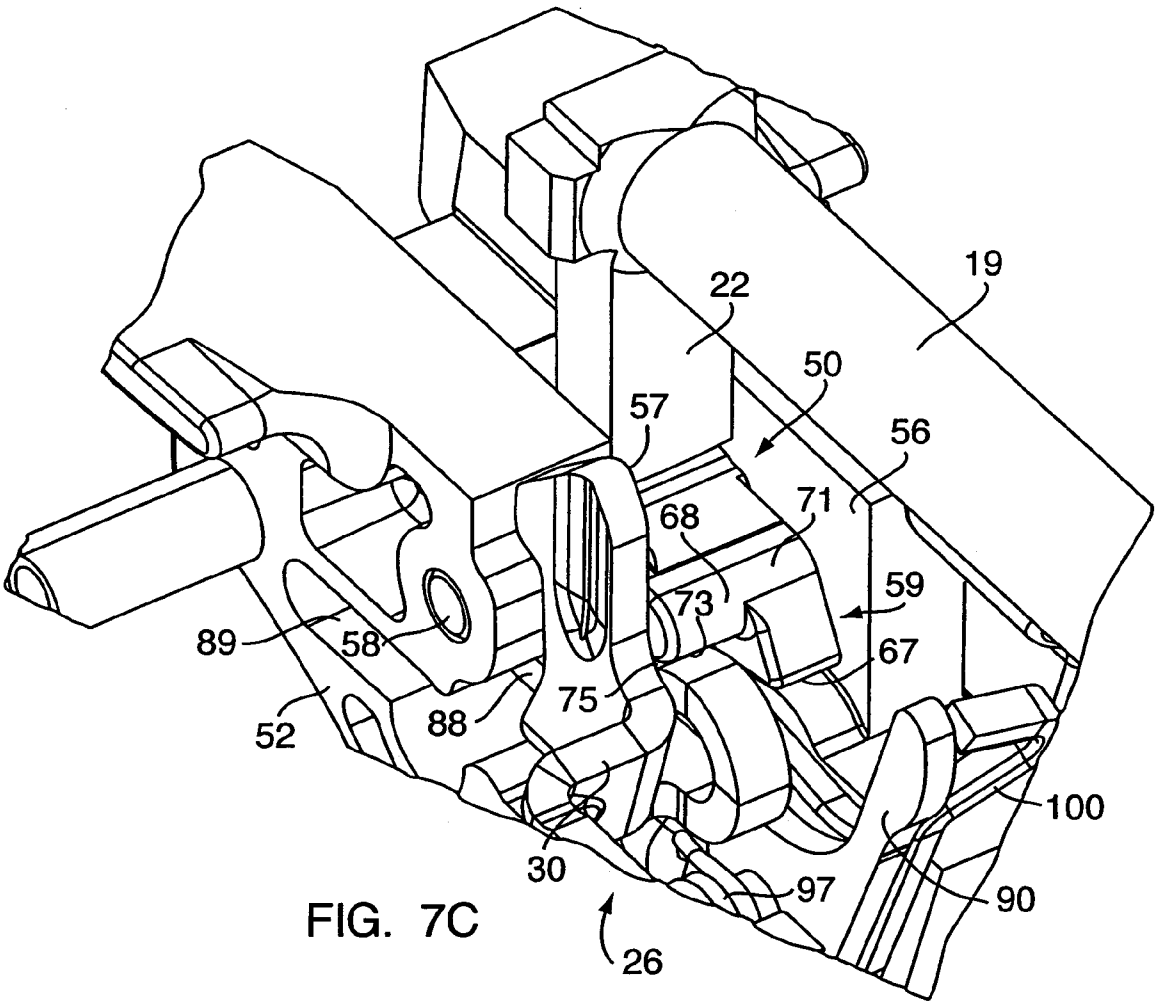


FIG. 7C

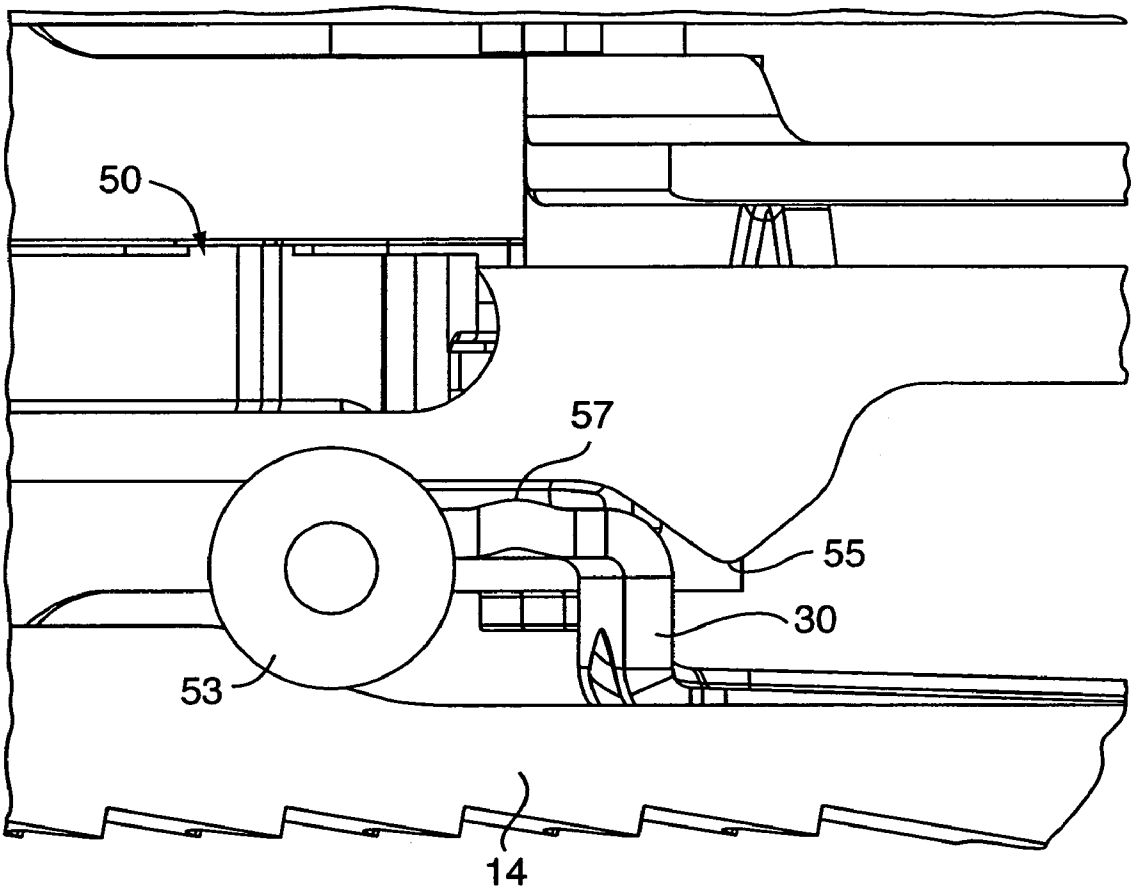


FIG. 7D

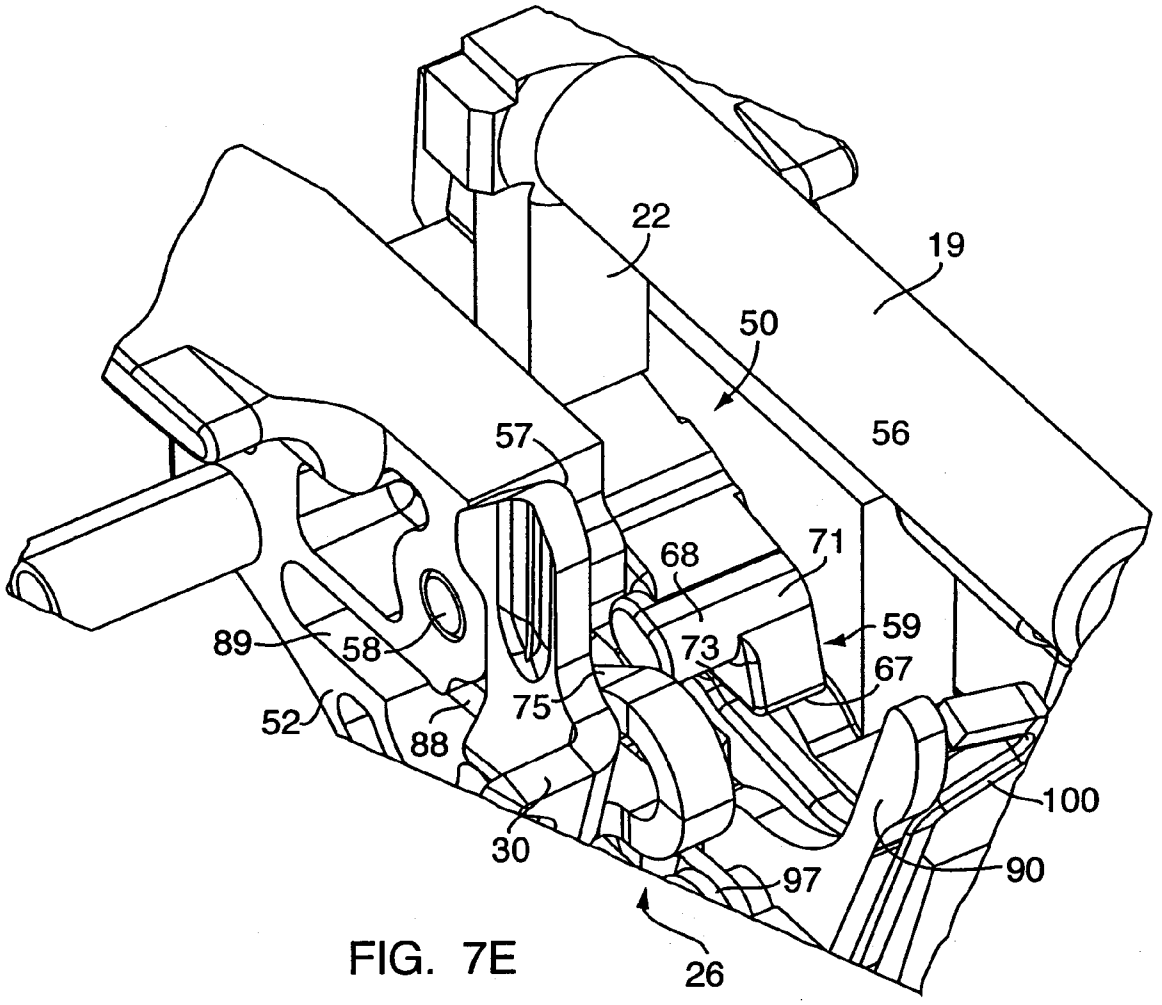


FIG. 7E

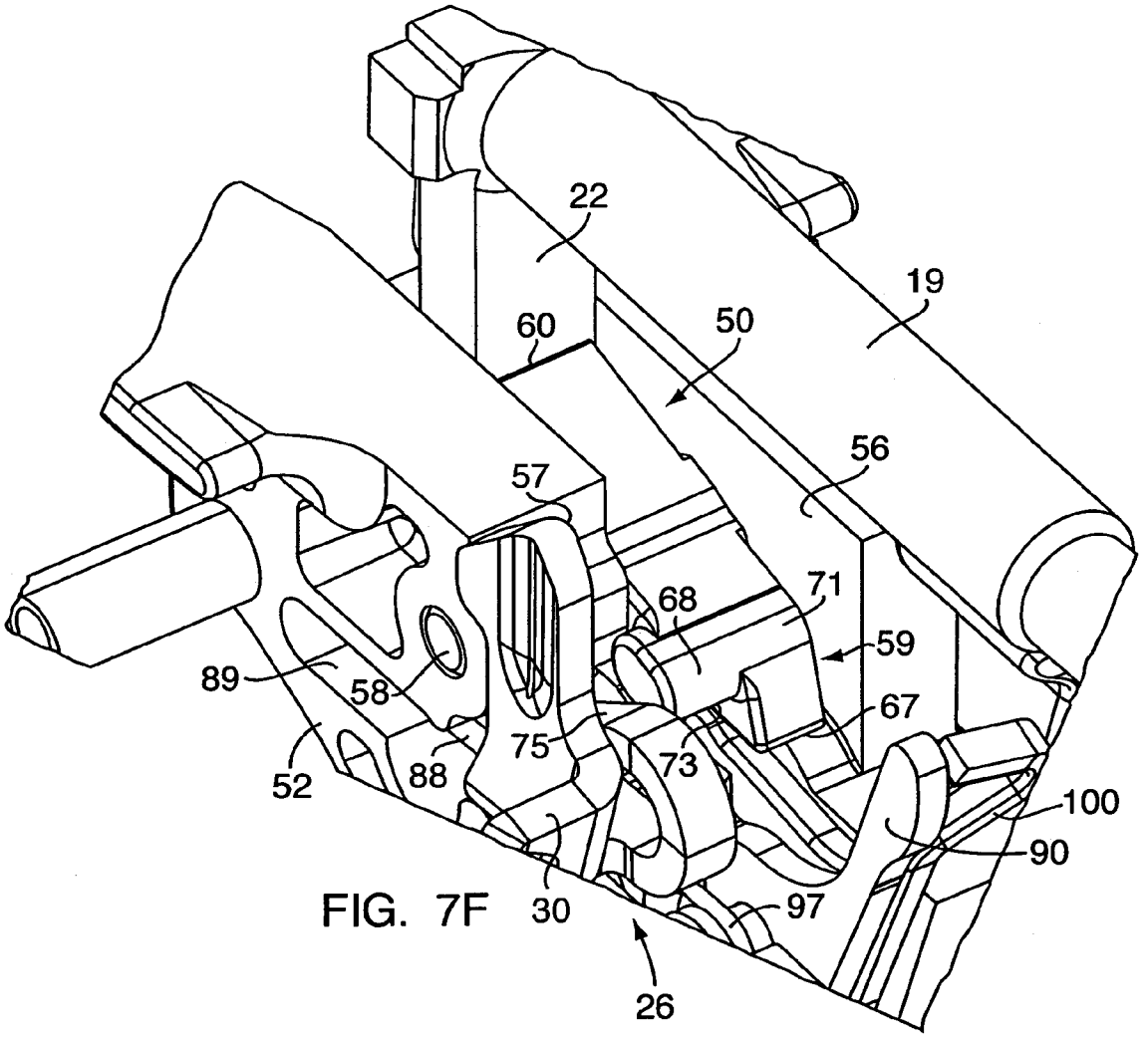


FIG. 7F

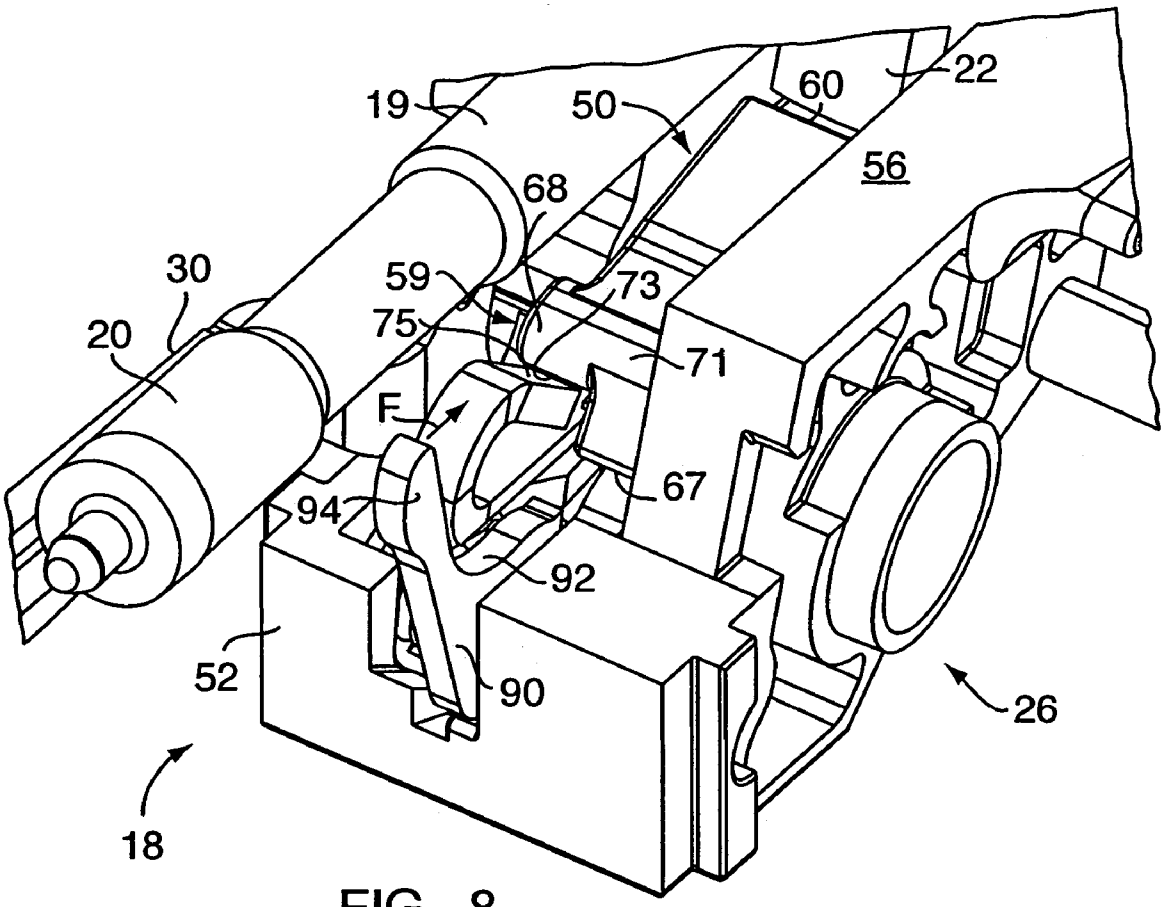


FIG. 8

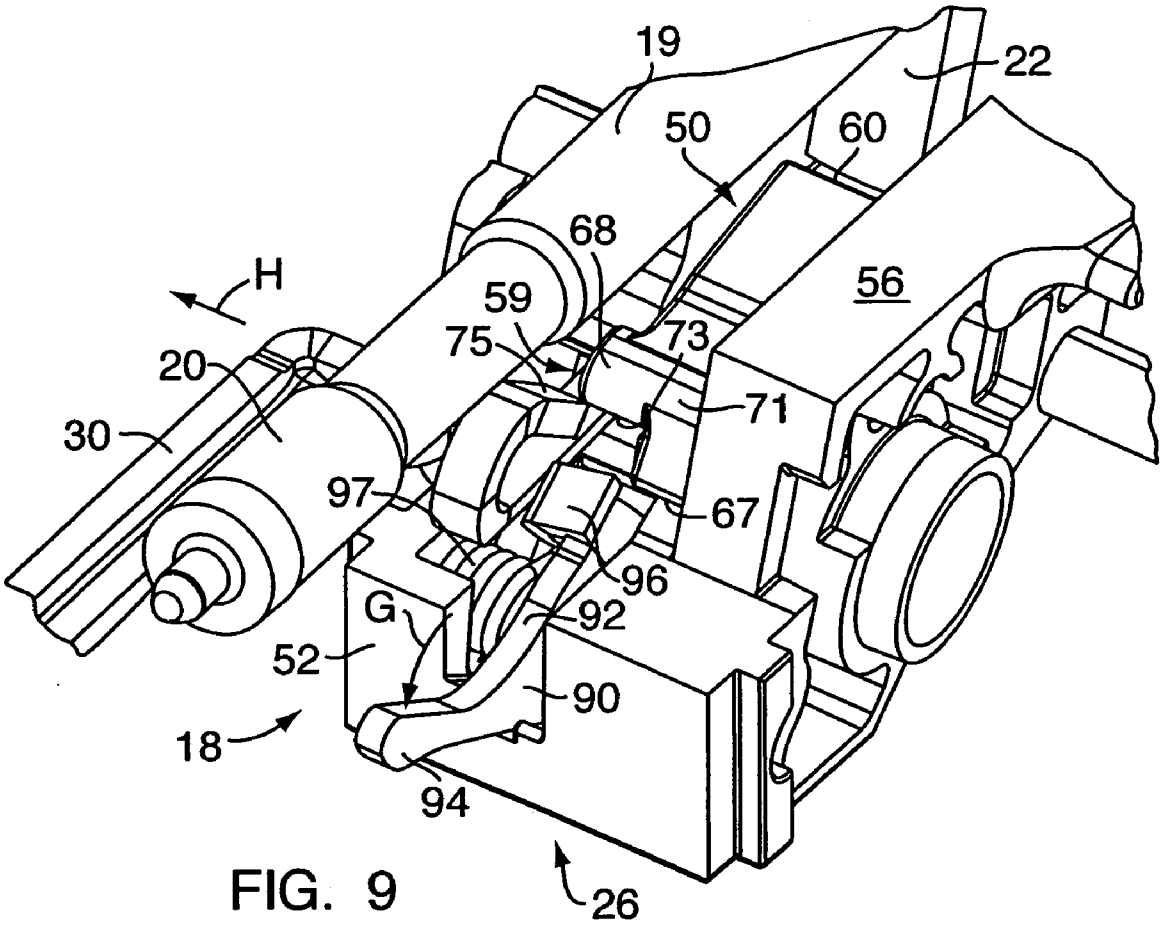


FIG. 9

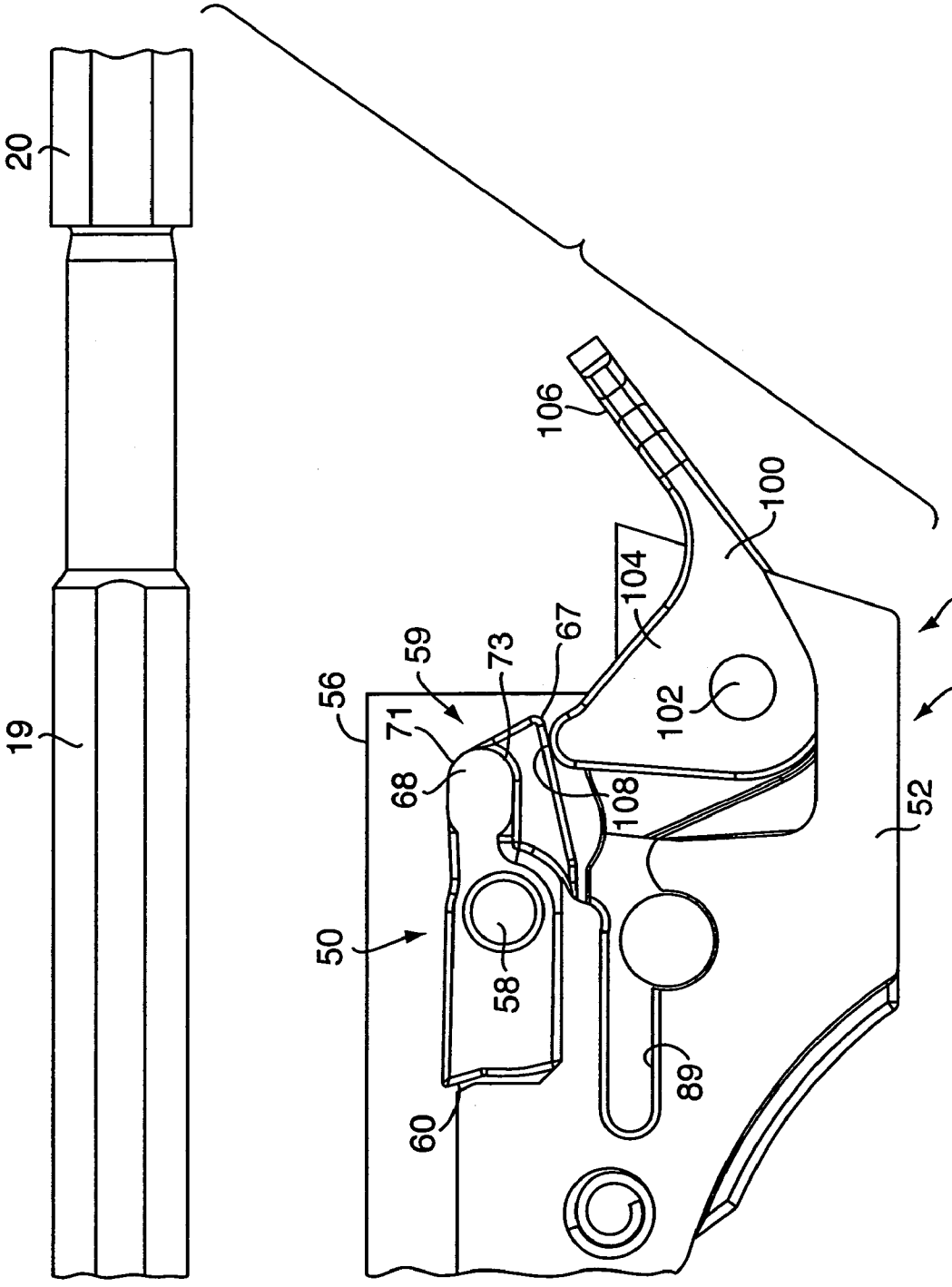
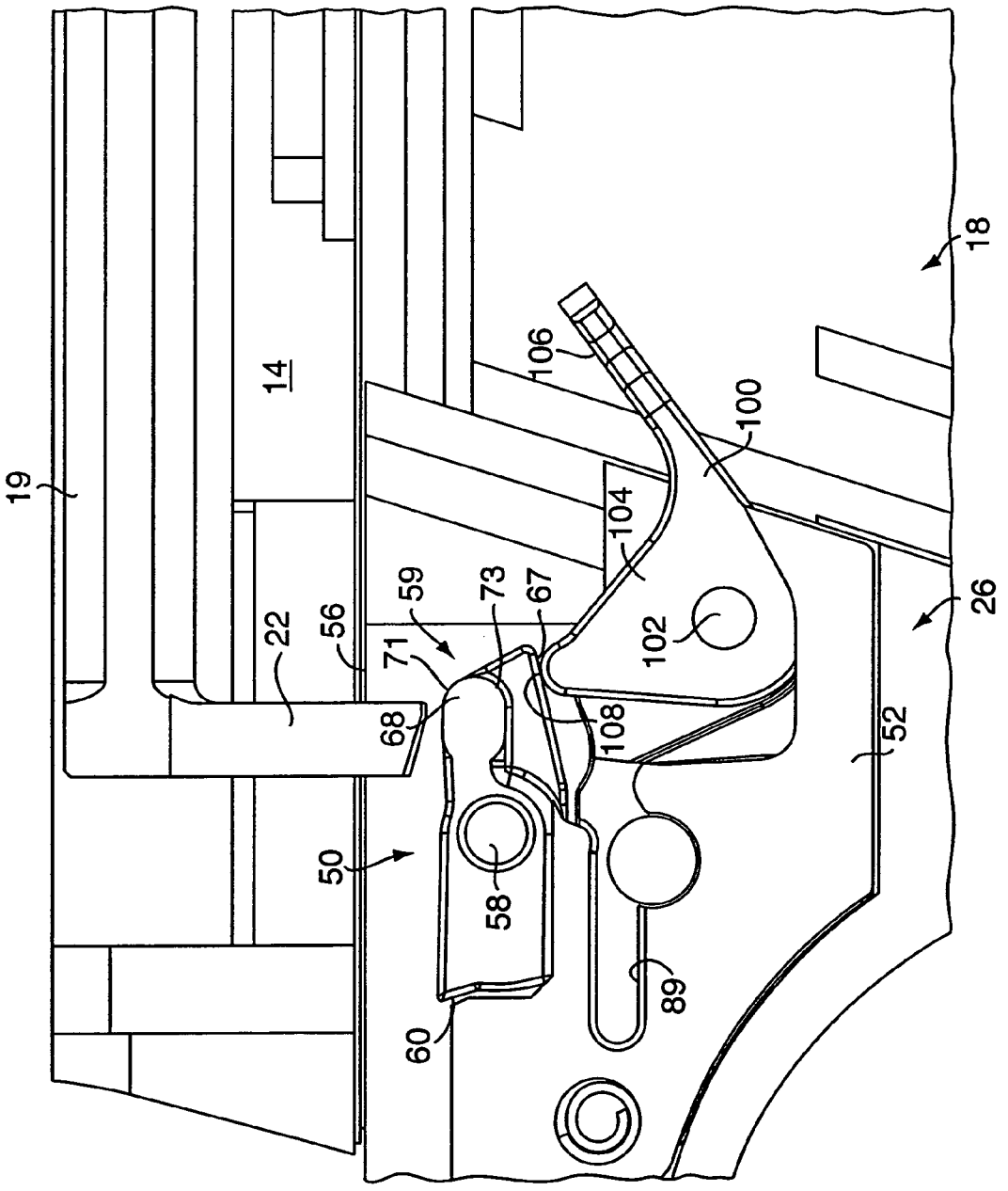


FIG. 10



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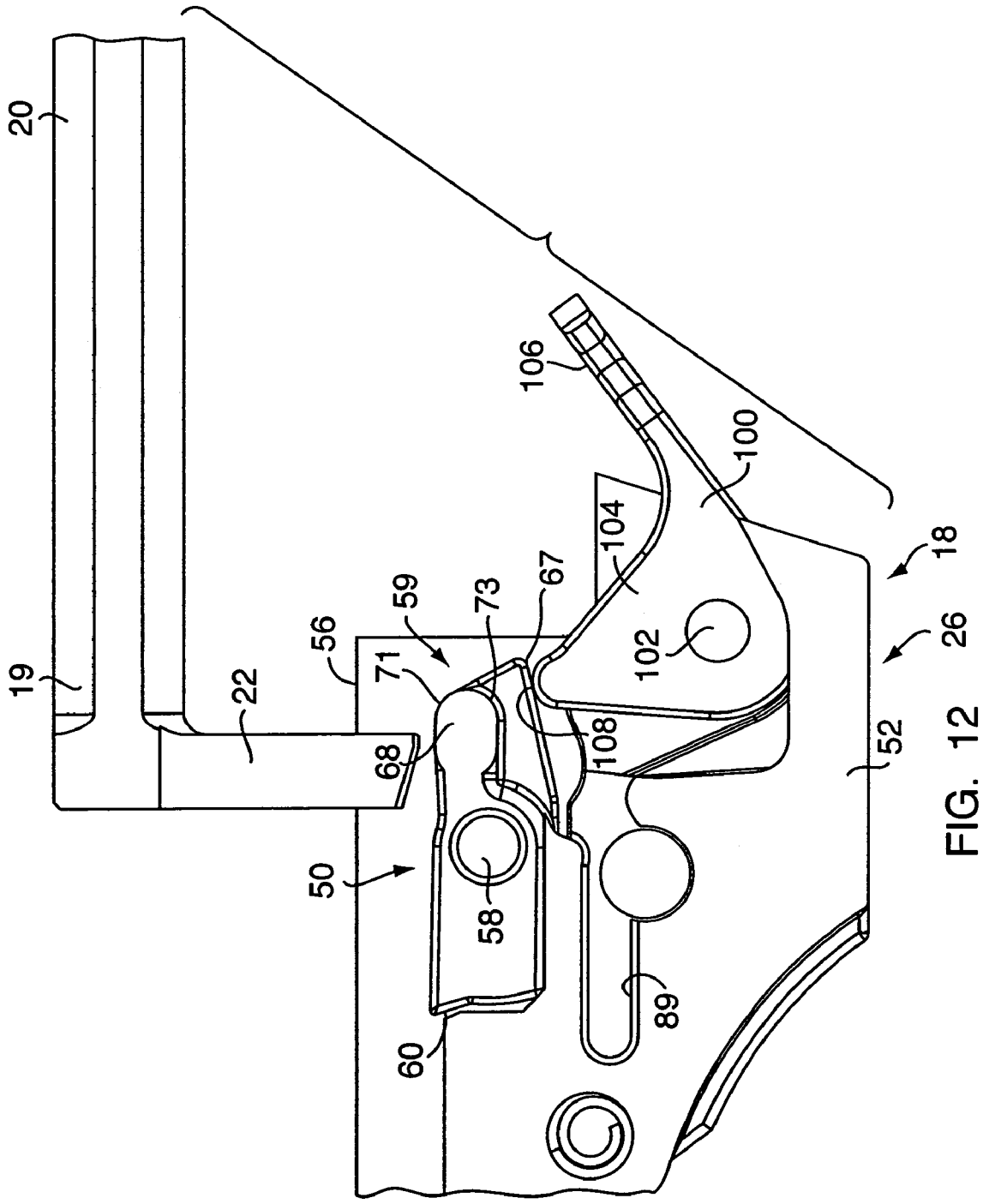

FIG. 12

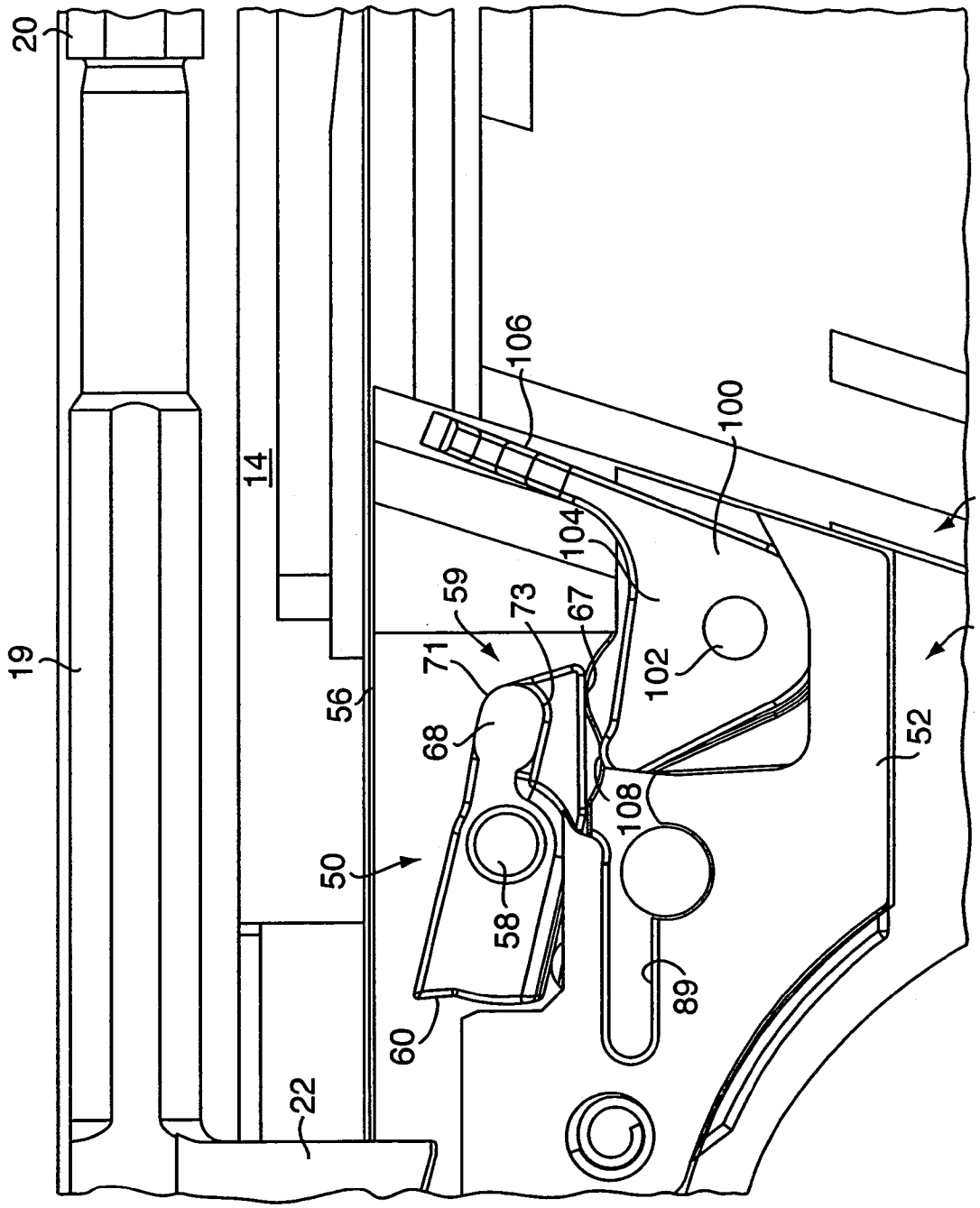

FIG. 13

FIRE CONTROL MECHANISM FOR A FIREARM

This application claims the benefit of the following U.S. Provisional Applications: Ser. No. 60/639,187; Ser. No. 60/638,594; Ser. No. 60/638,753; Ser. No. 60/638,593; Ser. No. 60/638,746; Ser. No. 60/638,592; Ser. No. 60/638,751; and Ser. No. 60/638,752, all filed Dec. 22, 2004, and all hereby incorporated by reference herein in their entireties.

FIELD OF THE INVENTION

The present invention relates to semiautomatic pistols or handguns and, more particularly, to fire control mechanisms for semiautomatic pistols or handguns.

BACKGROUND OF THE INVENTION

One type of fire control mechanism commonly used in semiautomatic handguns includes a hammer that is pivotable from a rearward cocked position to a forward position for impacting a firing pin. A sear releasably retains the hammer in the cocked position via a spring maintained in compression. When the trigger is moved, the sear is moved to release the hammer, which moves in response to the release of the stored energy in the spring, thereby allowing the hammer to strike the firing pin which in turn is driven forward to fire a chambered cartridge.

Another common fire control mechanism utilizes a striker-type firing pin. In handguns employing the striker-type firing pin, the trigger is connected to a trigger bar. Movement of the trigger causes movement of the trigger bar, which in turn (in certain embodiments) causes a sear to rotate about a pivot point. Upon rotation of the sear, a spring is compressed and an upper portion of the sear is displaced relative to the firing pin. Upon displacing the sear a sufficient distance to clear a depending leg of the firing pin, the firing pin is urged forward by a spring and strikes the rear of the cartridge, thereby discharging the firearm.

In either configuration (the pivotable hammer or the striker-type), the sear is an elongated element that is rotatable about a pivot point located substantially at one end thereof. By locating the pivot point at one end, the elongated element can be fairly easily rotated about the pivot point. In particular, because a substantial portion of the mass of the elongated element is located at one point distal from the pivot point, there is a tendency for the elongated element to rotate about the pivot point.

SUMMARY OF THE INVENTION

An embodiment of the present invention relates to a firearm having a frame, a slide, a trigger, a trigger bar, and a striker-type firing pin. The firearm further includes a rocker-like sear pivotally connected to the frame. A forward portion of the sear is configured for engagement with the trigger bar, and a rearward portion of the sear is configured for engagement with the firing pin. A sear biasing member such as a spring biases the sear in a first pivotal direction for engaging the firing pin. Rearwards movement of the trigger bar causes the trigger bar to engage the forward sear portion and pivot the sear in a second pivotal direction, against the action of the sear biasing member, until the rearward sear portion disengages from the firing pin. The firing pin thereafter moves forward for discharge of the firearm.

In another embodiment, in moving rearwards after discharge, the slide causes the trigger bar to temporarily laterally disengage from the sear. This allows the sear to pivot back in the first pivotal direction to catch the firing pin upon its rearward return. Subsequently, the slide returns to a forward position, allowing the trigger bar to reengage the sear, but typically only after the trigger is released and the trigger bar has returned to its forward position.

In another embodiment, the present invention provides a sear in which the mass of the sear is more evenly distributed on opposite sides of the pivot point. One advantage of a handgun having this type of fire control mechanism is that the sear is rendered more likely to remain stationary. In particular, a more positive force is required to cause the sear to rotate or move about its center of mass.

Additionally, an embodiment of the present invention provides a mechanism that inhibits movement of the sear when a magazine is not inserted into the handgun. With this mechanism, the handgun is rendered inoperative without a magazine in the magazine well. Even if a cartridge is ramped into the chamber, movement of the trigger should not discharge the firearm as long as the magazine is not inserted or is subsequently removed. Thus, the handgun and the magazine can be stored separately or readily separated to inhibit unauthorized use.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood from reading the following description of non-limiting embodiments, with reference to the attached drawings, wherein below:

FIGS. **1** and **2** are simplified schematic views of a semiautomatic handgun showing the slide thereof in battery and retired positions, respectively;

FIG. **3** is a simplified schematic perspective view of a fire control mechanism according to an embodiment of the present invention;

FIG. **4** is a simplified schematic elevational view of a sear of the fire control mechanism of the present invention;

FIG. **5** is a simplified schematic perspective view of the sear of FIG. **4**;

FIG. **6** is a simplified schematic perspective view of the engagement of the sear and a trigger bar of the fire control mechanism;

FIGS. **7**A through **7**C are simplified schematic views of the fire control mechanism of the present invention showing a sequential firing operation;

FIG. **7**D is a simplified schematic view of the fire control mechanism in which the trigger bar is urged away from the sear;

FIG. **7**E is a simplified schematic plan view of the fire control mechanism in which a camming surface on the slide is shown in preparation for engaging the trigger bar during rearward movement of the slide;

FIG. **7**F is a simplified schematic view of the fire control mechanism in which the trigger bar is fully displaced by the camming surface on the slide during movement of the slide;

FIGS. **8** and **9** are simplified schematic views of a magazine detection lever of the fire control mechanism; and

FIGS. **10** through **13** are simplified schematic views of a sear deactivation lever of the present invention.

DETAILED DESCRIPTION

Referring to FIGS. **1** and **2**, a semiautomatic pistol or handgun is shown generally at **10** and is hereinafter referred to as "handgun" **10**. The handgun **10** comprises a frame **12**, a slide **14**, a barrel **16**, and a fire control mechanism **18** (see FIG. **3**). The barrel **16** is disposed at the front aperture of the

slide **14** and is cooperatively linked therewith, and, together with the slide **14**, defines a longitudinal firing axis **17**. The barrel **16** has a rearward end adapted for receiving an ammunition cartridge **40**. A trigger **28** is pivotally mounted to the frame **12** to actuate the fire control mechanism to fire the handgun **10**. The frame **12** is fabricated of a high-impact polymer material, metal, a combination of polymer and metal, or the like. The fire control mechanism or means **18** is provided for discharging a round of ammunition upon actuation of the trigger **28**.

The slide **14** is fitted to opposingly-positioned rails **31** of the frame **12** to effect the reciprocal movement of the slide **14** along the longitudinal firing axis **17**. The rails **31** extend along the underside of the slide **14** in the longitudinal direction and are cooperative with the frame **12** to allow the cycling of the slide **14** between forward (battery) and rearward (retired) positions. The slide **14**, which is defined by a slide frame **29**, further includes a firing chamber, an ejection port **34**, and an ejection mechanism that provides for the ejection of the cartridge **40** through the ejection port **34** upon firing the handgun **10** or upon manual cycling of the slide **14**.

The cooperation of the frame **12**, the slide **14**, the barrel **16**, and the firing mechanism during the loading, firing, and ejecting of a cartridge **40** or a cartridge casing can be understood by referring to U.S. Pat. No. 5,086,579 entitled "DECOCKING MECHANISM FOR A SEMI-AUTOMATIC FIREARM"; U.S. Pat. No. 5,386,659 entitled "FIRE CONTROL MECHANISM FOR SEMIAUTOMATIC PISTOLS"; and U.S. Pat. No. 5,406,731 entitled "HANDGUN OF IMPROVED ERGONOMIC CONSTRUCTION," all of which are owned by the assignee of the present invention and are incorporated by reference herein.

Referring now to FIG. **3**, the fire control mechanism **18** includes a striker-type firing pin **19** having a forward firing pin portion **20** and a depending leg **22** extending down from the firing pin portion **20**. The fire control mechanism **18** also includes a sear assembly **26** that is engagable by the firing pin **19**. The sear assembly **26** is operably engagable with a trigger assembly that includes the trigger **28**. Upon operation of the handgun (via movement of the trigger **28**), a surface of the depending leg **22** selectively engages the sear assembly **26**.

The trigger **28** may be of unitary construction, as shown, or of a multiple-piece articulated construction. The trigger **28** is pivotally connected to a trigger bar **30** via a pin **35**. The trigger bar **30** may be biased in lateral directions via a spring or the like. Rearward movement of the trigger **28** causes movement of the trigger bar **30** in a rearward longitudinal direction. When the trigger **28** is actuated by being pressed in a rearward direction, the trigger **28** pivots about a pin **38**, thereby transmitting rearward longitudinal movement to the trigger bar **30** via the pin **35**. Longitudinal movement of the trigger bar **30** in a rearward direction, in turn, actuates the sear assembly **26**, e.g., it unblocks the sear assembly, thereby allowing the firing pin **19** to translate in a forward direction under the action of a decompressing firing pin spring for the firing pin portion **20** to engage a cartridge and fire the handgun.

Referring now to FIG. **4**, the sear assembly **26** of the present invention comprises a sear or sear means **50** for controllably releasing the firing pin upon actuation of the trigger bar, a sear block housing **52**, a sear spring or other biasing member **62**, and a frame **56**. (The frame **56** and housing **52** may be integral, and/or provided as part of the firearm frame **12**.) The sear **50** is operably mounted in the sear block housing **52** between walls of the frame **56** so as to be pivotal about a fulcrum **58**, which is located substantially at the center of mass of the sear **50**. (By "substantially," it is meant that the mass of the sear on each side of the fulcrum **58** varies no more than 20% from a perfect balance, e.g., each side may have a mass S**1**, S**2** of 0.5S±0.2S, where "S" is the mass of the sear and S**1**+S**2**=S. This provides a good balance for functionality according to the present invention, while still allowing for manufacturing variances or the like.) A forward portion **59** of the sear **50** directly forward of the fulcrum **58** is configured to inter-engage the trigger bar **30** and, optionally, a magazine detection lever **90** (discussed below). A rearward surface **60** of a rearward portion of the sear **50** directly behind the fulcrum **58** is configured to inter-engage the leg of the firing pin. The sear spring **62** is positioned underneath a bottom surface of the rearward portion of the sear **50** to urge the rearward portion upward such that the rearward surface **60** is engagable with the leg **22** of the firing pin **19**.

Referring now to FIG. **5**, the sear **50** is an elongated member having a major axis M. The elongated member is pivotable about the fulcrum **58**, which extends through the member in a direction that is substantially perpendicular (e.g., perpendicular within ±5 degrees) to the direction in which the major axis M extends. The forward portion **59** of the sear **50** is configured to have both a ramp portion **67** and a cam portion **68**. From a side elevation, the cam portion **68** may have a cross-sectional configuration having an upper rounded surface **71** and a lower rounded surface **73**, both of which extend perpendicular to the direction in which the major axis M extends and parallel to the direction in which the pivot axis defined by the fulcrum **58** extends. The ramp portion **67** extends downward from the lower rounded surface **73**. A downward-facing surface of the ramp portion **67** is substantially flat. Both the forward portion **59** and the rearward portion are dimensioned and configured to have substantially the same masses relative to the fulcrum **58**. Thus, the sear **50** is substantially balanced front-to-back.

Referring now to FIG. **6**, the dimensions and configuration of the sear **50** are such that the lower rounded surface **73** on the cam portion **68** acts cooperatively with the trigger bar **30**. In particular, the lower rounded surface **73** engages a corresponding sloped surface **75** on the trigger bar **30** such that as the trigger is pulled, the trigger bar **30** moves rearward in the direction of an arrow A and in a plane that is at least partially coplanar with a plane in which the sear **50** rotates. In doing so, the sloped surface **75** on the trigger bar **30** engages the lower rounded surface **73** of the cam portion **68**, the sear **50** is rotated in the direction of an arrow B, and the forward end of the sear **50** is urged upward, thereby causing the rearward surface **60** to move downward about the fulcrum **58**. At a pre-selected distance, the sear **50** is pivoted fully downward against the sear spring to allow the leg **22** of the firing pin **19** to disengage from the rearward surface **60**.

Referring now to FIGS. **7**A through **7**E, the operation of the handgun is illustrated. In FIG. **7**A, the depending leg **22** of the firing pin **19** is engaged by the sear **50**. As the trigger is pulled in the rearward direction (FIG. **7**B), the trigger bar **30** likewise moves rearward, and the sloped surface **75** on the trigger bar **30** engages the lower rounded surface **73** of the sear **50** to urge the front of the sear **50** up and the rearward surface down (the sear **50** is pivoted about the fulcrum **58**). The firing pin **19** is released and travels forward. The trigger bar **30** is fully extended in the rearward direction. Referring now to FIG. **7**C (the trigger bar **30** is still fully rearward), the firing pin **19** continues to move in the forward direction for the firing pin portion **20** to discharge a cartridge. After discharging the cartridge, the slide moves rearward into the retired position.

Referring now to FIGS. **7**D and **7**E, the slide **14** and the firing pin **19** are shown in retreat. In FIG. **7**D, as the slide moves rearward past a spring-biased firing pin safety **53**, a camming surface **55** integrally formed with an undersurface

of the slide **14** engages a receiving surface **57** on the trigger bar **30**. The receiving surface **57** is defined by a radius or arcuate surface that, when engaged by the camming surface **55** of the retreating slide **14**, urges the trigger bar **30** laterally away from the sear **50**. As can be seen in FIG. **7**E, upon retreat of the slide, the firing pin **19** is pulled back across the upper surface of the sear **50**.

Referring to FIG. **7**F, with the camming surface **55** still engaged with the receiving surface **57** to bias the trigger bar **30** laterally out of registration with the sear **50**, the depending leg **22** of the firing pin **19** engages the rearward surface **60** of the sear **50**, thus cocking the handgun. However, the handgun is not operational via the trigger because the trigger bar **30** is not engaged with the sear **50**. As the slide is fully seated in the battery position, the camming surface **55** moves forward out of registration with the receiving surface **57**, thus allowing the trigger bar **30** to return to its operational position in engagement with the sear **50**. Typically, this will not happen until the trigger **28** is released and the trigger bar **30** is allowed to move forward (e.g., by way of a standard trigger return spring or the like, not shown). In other words, if the trigger remains depressed, the trigger bar **30** will remain disengaged from the sear even after the slide has returned to its forward position.

A spring may be provided (not shown) for biasing the trigger bar **30** laterally towards the sear **50**, for helping the trigger bar **30** to return to its operational position in engagement with the sear **50** after the slide returns to the battery position. Also, as best shown in FIG. **3**, the trigger bar **30** may be provided with an extension **88** cooperative with a track or channel **89** in the sear block housing **52**, for purposes of laterally guiding the trigger bar **30** during displacement by the slide, and/or otherwise generally aligning the trigger bar **30** with the sear assembly **26**. As should be appreciated, the connection of the trigger **28**, trigger bar **30**, and the sear assembly **26** is such that the trigger bar **30** can be laterally displaced when pressure is exerted on the trigger bar extension **88** in a direction that is perpendicular to the direction in which the longitudinal firing axis extends.

Referring now to FIGS. **8** and **9**, the fire control mechanism **18** further includes a magazine detection lever **90** that operates in conjunction with the trigger bar **30**. The magazine detection lever **90** is positioned adjacent the trigger bar **30** and is rotatable about a pivot pin that extends laterally through the frame of the handgun. A plane in which the magazine detection lever **90** rotates may be either coincidental or parallel to the plane in which the sear rotates. The magazine detection lever **90** includes a body portion **92**, an arm **94** that extends away from the body portion **92** in the direction of the magazine well, and a ramped or camming surface **96** (FIG. **8**) at the body portion **92** so as to be engagable with the trigger bar **30** when the arm **94** extends into the magazine well. A torsion spring **97** provides a rotational force to the magazine detection lever **90** to urge the arm **94** into the magazine well.

Upon insertion of a magazine into the magazine well, the lip of the magazine slides along the front surface of the arm **94** of the magazine detection lever **90** and causes the magazine detection lever **90** to rotate about the pivot pin. The arm **94** is urged in the direction of an arrow F, and the body portion is rotated about the pivot pin. This rotation then disengages the camming surface **96** of the magazine detection lever **90** from the trigger bar **30** and allows the trigger bar **30** to be urged back in towards the center of the handgun and into registration with the ramp of the sear **50**. Upon removal of the magazine from the magazine well, the arm **94** is rotated in the direction of an arrow G under the bias of the torsion spring, as is shown in FIG. **9**, and the body portion **92** rotates such that the camming surface **96** engages the trigger bar **30** and displaces it in the direction of an arrow H, thereby causing the trigger bar **30** to come out of registration with the ramp of the sear **50**. Should the magazine not be fully engaged with the handgun, the trigger bar **30** will also be laterally displaced so as to cause the trigger bar **30** to come out of registration with the sear **50**.

Referring now to FIGS. **3**, **4**, and **10-13**, the fire control mechanism **18** further includes a sear deactivation lever **100** that operates in conjunction with the sear **50**. The sear deactivation lever **100** is positioned adjacent the magazine detection lever **90** and is rotatable about a pivot pin **102** that extends laterally through the frame of the handgun. A plane in which the sear deactivation lever **100** rotates is parallel to the plane in which the magazine detection lever **90** rotates and at least partially coincidental to the plane in which the sear **50** rotates. At least a portion of the sear deactivation lever **100** registers with the ramp portion **67** of the sear **50** such that movement of the sear deactivation lever **100** effects the movement of the sear **50**.

The sear deactivation lever **100** includes a body portion **104**, an arm **106** that extends away from the body portion **104**, and a sear contacting surface **108** at the body portion **104**. The body portion **104** is mounted to be pivotable about the pivot pin **102**. The sear contacting surface **108** may be machined, cast, or otherwise integrally formed with the body portion **104** at a rearward surface thereof. The arm **106** extends away from the body portion **104** and may be bent, twisted, or otherwise configured for engagement with a tool (not shown).

When the magazine is removed from the handgun, the firing chamber is empty, and the slide **14** is moved to its retired position and locked, the tool is inserted through the ejection port of the slide **14** and pressed against the arm **106** of the sear deactivation lever **100** to urge the arm **106** into the empty magazine well. Upon rotation of the sear deactivation lever **100**, the sear contacting surface **108** engages the ramp portion **67** of the sear **50** and rotates the forward portion of the sear **50** upward while the rearward portion of the sear **50** is correspondingly rotated down. The slide **14** can then be closed (returned to its battery position). Because the rearward portion of the sear **50** is rotated down, the depending leg **22** of the firing pin **19** can clear the sear **50** (FIGS. **11** and **12**) upon forward movement of the slide **14**. Thus, because the manual pivoting of the sear deactivation lever **100** rotates the sear **50** to allow the firing pin **19** to move forward unobstructed, the fire control mechanism is deactivated without dry-firing the handgun. A lever, clip, or similar mechanism (not shown) can then be manipulated to allow the slide **14** to be removed from the frame.

Referring now to FIG. **13**, to replace the slide **14** on the frame, the rearward end of the slide **14** is brought into engagement with the rails on the forward end of the frame. The slide **14** is then slid in the rearward direction until it is fully seated on the frame. To return the sear deactivation lever **100** back to its active position in preparation for firing the handgun, a magazine is inserted into the magazine well. Upon such insertion, the arm **106** of the sear deactivation lever **100** is rotated upward, the forward end of the sear **50** is allowed to pivot downward, and the rear portion of the sear **50** is correspondingly allowed to pivot upward. Racking the slide **14** then allows the depending leg **22** of the firing pin **19** to engage the rearward surface **60** of the sear **50**, thus cocking the handgun.

An embodiment of the present invention as described above is a fire control mechanism for a semiautomatic handgun. The handgun has a frame, a slide reciprocally mounted on the frame, a barrel, a firing pin, and a trigger. In this embodiment, the fire control mechanism may include a sear assembly in which a sear is mounted in a sear block housing, the sear being operably mounted so as to be pivotal about a

fulcrum located substantially at the center of mass of the sear. The sear is pivotally movable about the fulcrum in response to the rearward longitudinal movement of a trigger bar.

In another embodiment of the present invention as described above, the handgun may include a fire control mechanism having a magazine detection lever that is operably engagable with a trigger bar of the fire control mechanism. A spring provides a rotational force to the magazine detection lever to urge an arm into a magazine well of the handgun into which a magazine can be received. A camming surface on a body of the magazine detection lever preferably engages the trigger bar and biases the trigger bar away from the sear.

Although this invention has been shown and described with respect to the detailed embodiments thereof, it will be understood by those of skill in the art that various changes may be made and equivalents may be substituted for elements thereof without departing from the scope of the invention. In addition, modifications may be made to adapt a particular situation or material to the teachings of the invention without departing from the essential scope thereof. Therefore, it is intended that the invention not be limited to the particular embodiments disclosed in the above detailed description, but that the invention will include all embodiments falling within the scope of the above description.

What is claimed is:

1. A firearm comprising:

a frame, and a trigger connected to the frame;

a trigger bar having a receiving surface, the trigger bar connected to the trigger for rearwards movement when the trigger is actuated;

a firing pin operably disposed in a breech block located on the frame;

a sear pivotally connected to the frame about a fulcrum and having forward and rearward portions on opposite sides of the fulcrum, said forward portion being configured for engagement with the trigger bar and said rearward portion being configured for engagement with the firing pin;

a sear biasing member operably disposed in the frame for biasing the sear in a first pivotal direction for engaging the firing pin; and

a slide operably connected to the frame and having a camming surface on an undersurface thereof;

wherein the camming surface engages the receiving surface on the trigger bar upon a movement of the slide in a rearwards direction; and

wherein the movement of the slide in a rearwards direction causes the camming surface to exert a lateral force on the trigger bar to bias the trigger bar laterally out of registration with the sear.

2. The firearm of claim **1** wherein the trigger bar is configured to pivot the sear in a second pivotal direction against the action of the sear biasing member, when the trigger bar is moved in a rearwards direction, for selective disengagement of the rearward sear portion from the firing pin, whereby said firing pin thereafter moves forward for discharge of the firearm.

3. The firearm of claim **2** wherein the sear fulcrum is located substantially at a center of mass of the sear.

4. The firearm of claim **2** wherein:

the sear comprises an elongated member having a major axis, said fulcrum lying substantially perpendicular to the major axis;

the forward sear portion includes a cam having a rounded surface; and

a rear portion of the trigger bar includes a sloped surface configured to engage the rounded surface of the cam for pivoting the sear in the second pivotal direction when the trigger bar is moved rearwards.

5. The firearm of claim **2** wherein:

the firearm further comprises a slide operably disposed on the frame and having a cam surface on an underside thereof; and

the trigger bar includes a receiving surface, wherein the cam surface of the slide is configured to engage the trigger bar receiving surface for disengaging the trigger bar from the sear when the slide moves to a rearward position, said trigger bar reengaging the sear when the slide moves to a forward position.

6. The firearm of claim **2** further comprising:

a sear deactivation lever pivotally connected to the frame and configured for selectively rotating the sear in the second pivotal direction upon manual actuation of the sear deactivation lever.

7. The firearm of claim **6** wherein:

the forward portion of the sear includes a substantially flat ramp portion; and

the sear deactivation lever comprises a body portion having a sear contacting surface, and an arm connected to the body portion for manual pivoting of the sear deactivation lever, wherein the sear contacting surface is configured for engaging the ramp portion of the sear for rotating the sear in the second pivotal direction upon manual actuation of the sear deactivation lever arm.

8. The firearm of claim **2** further comprising:

a magazine detection lever operably connected to the frame and configured for disengaging the trigger bar from the sear when a magazine well portion of the frame is without a magazine fully inserted therein.

9. The firearm of claim **8** wherein:

the magazine detection lever is pivotal between first and second positions, said lever having an arm portion extending into the magazine well, wherein in the first position the lever disengages the trigger bar from the sear and in the second position the lever allows the trigger bar to engage the sear, said lever pivoting from the first position to the second position upon insertion of a magazine into the magazine well a sufficient distance to fully depress the arm portion; and

the firearm further comprises a lever biasing member operably connected to the lever for biasing the lever towards the first position for disengagement of the trigger bar from the sear when the magazine well is without a magazine fully inserted therein.

10. A firearm comprising:

a frame, and a firing pin operably disposed in a breech block located on the frame;

a sear pivotally connected to the frame about a fulcrum and having forward and rearward portions on opposite sides of the fulcrum, wherein the rearward portion is configured for selectively engaging the firing pin;

a trigger bar having a receiving surface, the trigger bar engaging the forward portion of the sear and configured for actuating the sear to release the firing pin when the trigger bar is moved rearwards; and

a slide operably connected to the frame and having a camming surface on an undersurface thereof;

wherein the camming surface engages the receiving surface on the trigger bar upon a movement of the slide in a rearwards direction; and

wherein the movement of the slide in a rearwards direction causes the camming surface to exert a lateral force on the trigger bar to bias the trigger bar laterally out of registration with the sear.

11. The firearm of claim 10 wherein:
the forward portion of the sear has a rounded camming surface which extends perpendicular to a direction of a major axis of the sear and parallel to a pivot axis of the sear defined by the fulcrum; and
the trigger bar is configured to engage the camming surface for actuating the sear.

12. The firearm of claim 10 wherein the sear fulcrum is located substantially at a center of mass of the sear.

13. The firearm of claim 10 further comprising:
a magazine detection lever housed in the frame for disengaging the trigger bar from the sear unless a magazine is fully inserted into a magazine well portion of the frame.

14. The firearm of claim 10 further comprising:
a slide moveable along the frame from forward to rearward positions, wherein the slide is configured for disengaging the trigger bar from the sear upon movement of the slide from the forward to the rearward positions.

15. The firearm of claim 10 further comprising:
a sear deactivation lever pivotally connected to the frame proximate the sear for controllably disengaging the sear from the firing pin upon manual actuation of the sear deactivation lever.

16. A firearm comprising:
a frame, and a trigger bar having a receiving surface, the trigger bar being operably disposed in the frame;
a firing pin;
a sear operably mounted in the frame for controllably releasing the firing pin upon actuation of the trigger bar; and
a slide operably connected to the frame and having a camming surface on an undersurface thereof;
wherein the camming surface engages the receiving surface on the trigger bar upon a movement of the slide in a rearwards direction; and
wherein the movement of the slide in a rearwards direction causes the camming surface to exert a lateral force on the trigger bar to bias the trigger bar laterally out of registration with the sear.

17. A firearm comprising:
a frame with a magazine well; a firing mechanism operably housed in the frame and having a sear and a trigger bar engagable with the sear;
a magazine detection lever operably engagable with the trigger bar; and
a biasing member acting upon the magazine detection lever to urge an arm portion thereof into the magazine well, wherein the magazine detection lever biases the trigger bar into disengagement from the sear unless a magazine is fully inserted into magazine well against the arm portion of the lever, wherein the magazine detection lever biases the trigger bar into lateral disengagement from the sear.

18. A firearm comprising:
a frame, and a trigger connected to the frame;
a trigger bar connected to the trigger for rearwards movement when the trigger is actuated;
a firing pin operably disposed in a breech block located on the frame;
a sear pivotally connected to the frame about a fulcrum and having forward and rearward portions on opposite sides of the fulcrum, said forward portion being configured for engagement with the trigger bar and said rearward portion being configured for engagement with the firing pin; and
a sear biasing member operably disposed in the frame for biasing the sear in a first pivotal direction for engaging the firing pin;
wherein the trigger bar is configured to pivot the sear in a second pivotal direction against the action of the sear biasing member, when the trigger bar is moved in a rearwards direction, for selective disengagement of the rearward sear portion from the firing pin, whereby said firing pin thereafter moves forward for discharge of the firearm; and
wherein the sear fulcrum is located substantially at a center of mass of the sear.

19. A firearm comprising:
a frame, and a trigger connected to the frame;
a trigger bar connected to the trigger for rearwards movement when the trigger is actuated;
a firing pin operably disposed in a breech block located on the frame;
a sear pivotally connected to the frame about a fulcrum and having forward and rearward portions on opposite sides of the fulcrum, said forward portion being configured for engagement with the trigger bar and said rearward portion being configured for engagement with the firing pin;
a sear biasing member operably disposed in the frame for biasing the sear in a first pivotal direction for engaging the firing pin; and
a magazine detection lever operably connected to the frame and configured for disengaging the trigger bar from the sear when a magazine well portion of the frame is without a magazine fully inserted therein;
wherein the trigger bar is configured to pivot the sear in a second pivotal direction against the action of the sear biasing member, when the trigger bar is moved in a rearwards direction, for selective disengagement of the rearward sear portion from the firing pin, whereby said firing pin thereafter moves forward for discharge of the firearm.

20. The firearm of claim 19 wherein:
the magazine detection lever is pivotal between first and second positions, said lever having an arm portion extending into the magazine well, wherein in the first position the lever disengages the trigger bar from the sear and in the second position the lever allows the trigger bar to engage the sear, said lever pivoting from the first position to the second position upon insertion of a magazine into the magazine well a sufficient distance to fully depress the arm portion; and
the firearm further comprises a lever biasing member operably connected to the lever for biasing the lever towards the first position for disengagement of the trigger bar from the sear when the magazine well is without a magazine fully inserted therein.

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